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EXAMINER

OJINI, EZIAMARA ANTHONY

ART UNIT PAPER NUMBER

3723

DATE MAILED: 11/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/705,371

Applicant(s)

CRON, BRIAN E.

Examiner

Anthony Ojini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 November 2003.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-28 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 12-28 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 10 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/10/03.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicant's cancellation of **claims 1-11,29-35** in filed 11/10/03 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 12-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 12, line 6, change the term "the pad" to ----the polishing pad----; and
in line 7, change the term "condition stone" to ---conditioning stone---.

In claims 16, 25, line 2, the expression "the polishing surface" lack antecedent basis.

In claim 18, line 2, change the term "the pad" to ----the polishing pad----; and
in line 3, the expression "the polishing surface" lack antecedent basis.

In claim 20, lines 10,11, change the expression " the pad" to ---- the polishing pad----; and
in line 11, change the term "condition stone" to ---conditioning stone---.

In claim 27, lines 3,4, the expression "the polishing surface" lack antecedent basis.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 13, 19-24, 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Applicant Admitted Prior Art (AAPA) in view of **Inoue et al.** (6,443,816 B2).

With respect to claim 12, AAPA discloses a method for conditioning a surface of a polishing pad after chemical-mechanical polishing of a semiconductor substrate with the pad surface (18), comprising the following steps: providing a conditioning disk (24); positioning the pad with the pad surface against the conditioning stone and displacing the pad relative to the conditioning stone to rub the pad surface with the condition stone.

AAPA fails to disclose a steam outlet port proximate the conditioning stone, and flowing steam through the outlet port and across the pad surface as the pad surface is rubbed with the conditioning stone.

Inoue et al. disclose a steam outlet nozzles (7-1 to 7-4) being configured to jet steam onto the pad surface during the conditioning of the pad (see col. 3, lines 25-51 & fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform the method of **AAPA** with steam jet nozzles being configured to jet steam onto the pad surface during the conditioning of the pad surface in view of **Inoue et al.** so as to dislodge and remove particulates embedded in the pad.

With respect to claims 13, 24, **AAPA** fails to disclose wherein a jet steam is jetted onto the pad surface to impacts the surface with a pressure of from about **10 psig** (24psi) to **20 psig** (34psi).

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Inoue et al. disclose a steam outlet port (7-1 to 7-4), the steam outlet port being configured to jet steam onto the pad surface such that the steam impacts the surface with a pressure of from about 0.01 Mpa (1.45 psi) to 0.7 Mpa (101 psi).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of **AAPA** with steam jet nozzles being configured to jet steam onto the pad surface such that the steam impacts the surface with a pressure of from about 0.01 Mpa (1.45 psi) to 0.7 Mpa (101 psi) in view of **Inoue et al.** so as to dislodge and remove particulates embedded in the pad.

With respect to claims 19,28, AAPA fails to disclose steps of removing the pad surface from against the conditioning stone to complete the conditioning of the pad surface with the conditioning stone; and after the conditioning of the pad surface with the conditioning stone is completed, exposing the pad surface to additional steam.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform method of **AAPA** with steps of removing the pad surface from against the conditioning stone to complete the conditioning of the pad surface with the conditioning stone; and after the conditioning of the pad surface with the conditioning stone is completed, exposing the pad surface to additional steam so as to make sure particulates embedded in the pad are remove completely.

With respect to claim 20, AAPA is discussed above in claim 12. **AAPA** also discloses step of providing a semiconductor substrate having a surface, which is to be chemical-mechanical polished (see page 2,3 & fig. 2); providing a polishing pad proximate the semiconductor

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substrate surface and utilizing a surface of the polishing pad to chemical-mechanical polish the semiconductor substrate surface.

With respect to claims 21,22,23, AAPA fails to disclose wherein a steam is jetted onto the pad surface from a plurality of nozzles generating overlapping spray patterns of the steam and wherein the nozzle spray patterns are fans in which the steam impacts the pad surface at angles from 0° to 45°

Inoue et al. disclose a steam outlet ports (7-1 to 7-4) generating overlapping spray patterns of the steam and wherein the nozzle spray patterns are fans in which the steam impacts the pad surface at angles from 0° to 45° (see fig.1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform method of **AAPA** with steam jet nozzles generating overlapping spray patterns of the steam and wherein the nozzle spray patterns are fans in which the steam impacts the pad surface at angles from 0° to 45° in view of **Inoue et al.** so as to dislodge and remove particulates embedded in the pad.

Claims 14,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Applicant Admitted Prior Art (AAPA)** in view of **Inoue et al.** as applied to claim 12 above, and further in view of **Nishimura et al.** (6,332,835 B1).

With respect to claim 14, AAPA fails to disclose wherein a steam has a temperature of at least 200° F as it flows through the outlet port.

Nishimura et al. disclose a steam that has a temperature of at least 200° F as it flows through the outlet port (see col. 9, lines 65-67).

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to perform method of **AAPA with** a steam that has a temperature of at least 200⁰ F as it flows through the outlet port in view of **Nishimura et al.** so as to dislodge and remove particles from the entire surface of the pad.

With respect to claim 15, please refer to claims 13,14.

Claims 16-18 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Applicant Admitted Prior Art (AAPA)** in view of **Inoue et al.** as applied to claims 12, 20 above, and further in view of **Lorimer** (6,589,878 B1).

With respect to claims 16-17, 25-26, AAPA fails to disclose ammonium and ammonium citrate within a steam.

Lorimer discloses a mixture of steam and ammonia but fail to teach ammonium and ammonium citrate within a steam.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of **AAPA with** a mixture of steam with ammonia in view of Lorimer so as to remove particle contaminates.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide apparatus of **AAPA with** ammonium and ammonium citrate within a steam so as to dislodge and remove particles from the entire surface of the pad, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ

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416. See also *Ballas Liquidating Co. v. Allied industries of Kansas, Inc.* (DC Kans) 205 USPQ 331.

With respect to claim 18, AAPA is discussed in claim 16. AAPA also discloses wherein the chemical-mechanical polishing utilizes the pad to polish a copper-containing material (see page 2, [0003]).

With respect to claim 27, AAPA is discussed in claim 16. AAPA also discloses wherein the semiconductor substrate comprises a copper-containing material at the surface, which is chemical-mechanical polished (see page 2, [0003]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Ojini whose telephone number is 703 305 3768. The examiner can normally be reached on 7 to 4 Tuesday-Friday with every other Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Hail can be reached on 703 308 2687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "A. B. Smith" or similar, written in a cursive style.

AO
11/9/04